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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Tonolli Site- Meeting Conducted During Public Comment Period

DATE: 9-29-92

FROM: Donna M. McCartney, RPM (3HW24) DMc
Central PA Remedial Section

TO: Tonolli Site File

On Wednesday, September 9, 1992, EPA participated in a meeting with a group of potentially responsible parties (PRPs) for the Tonolli Corporation Superfund Site. This meeting had been requested by the PRPs for the purposes of directly delivering their major comments on the July 18, 1992 Proposed Plan for Tonolli to EPA Region III. The meeting participants included representatives of the Pennsylvania Department of Environmental Resources (PADER), EPA's Regional staff and management, and technical and legal representatives for six of the Tonolli Site PRPs. A list of meeting participants is attached to this memo.

During this meeting, the Tonolli Site PRPs presented the same fundamental comments which are documented in their August 27, 1992 written submission to EPA, which constituted their comments on the July 18, 1992 Proposed Plan (copy attached). EPA indicated that all comments submitted during the public comment period for the Proposed Plan would be seriously considered and weighed in preparing the final decision document for the Tonolli Site.

TONOLLI SUPERFUND SITE

MEETING OF SEPT. 9, 1992

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JOHNSON CONTROLS

August 27, 1992

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Region III
841 Chestnut Building
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Donna McCartney (3HW27)
Remedial Project Manager
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Re: Comments to Proposed Plan for Tonolli Corporation Superfund Site, Nesquehoning, Pennsylvania

Dear Mr. Sternberg and Ms. McCartney:

On behalf of the Tonolli Site Steering Committee, Johnson Controls, Inc. submits the following comments to the United States Environmental Protection Agency ("U.S. EPA") regarding the agency's Proposed Plan for the Tonolli Corporation Superfund Site located in Nesquehoning, Pennsylvania. Our comments will address five general areas:

- U.S. EPA's selection of a remedy which requires soil stabilization before consolidation in the on-site landfill;
- Statements made in the Proposed Plan about the site groundwater;
- Ambiguous statements in the Proposed Plan about stormwater treatment;
- The selection of a soil cleanup standard based on use of the Integrated Uptake/Biokinetic Model; and
- Off-site cleanup requirements.

1. Soil Stabilization Requirements.

In its Proposed Plan, U.S. EPA chose Alternative 6 over Alternative 5 (both as amended by the agency relative to the site Feasibility Study). The principal difference between the alternatives concerns stabilization of on-site soil prior to consolidation in the contiguous landfill unit. The agency offers a number of rationales for this decision:

- the treatment of the soil will render contaminants less soluble and less mobile (page 10);
- stabilization will result in a greater degree of protection in case the cap is breached (page 14);
- stabilization will significantly reduce the threat because of decreased mobility (pages 14-15);
- while stabilization will increase the volume, it will reduce the mobility and toxicity of soil contaminants (page 15); and
- there is a statutory preference for treatment (page 16).

Of the foregoing, the only proposition with which we agree is the last - there is a statutory preference for treatment. However, Congress intended a preference for "technologies that, in whole or in part, will result in a permanent and significant decrease in the toxicity, mobility, or volume of a hazardous substance, pollutant, or contaminant." 42 U.S.C. § 9621(b). Furthermore, the decision concerning treatment must be made in the context of the particular site and take into account cost. § 9621(a). Application of these principles to the Tonolli Site indicates that the soil treatment proposed by U.S. EPA does not effectively reduce toxicity, mobility, or volume and also does not additionally protect human health or the environment. Nevertheless, this soil treatment increases the estimated costs at the site by approximately $11.8 million. Thus, Alternative 6 offers equivalent protection at a significant cost increase and is therefore not a cost effective remedy.

Table 1 compares Alternatives 5 and 6 as discussed in the Proposed Plan under the first seven criteria set forth in the National Contingency Plan. Both protect human health and the environment (page 13) and comply with ARARs (page 13). Both exhibit long-term effectiveness and permanence and reduce toxicity, mobility, and volume through extensive use of treatment of:

- stormwater;
- groundwater;
- landfill leachate;
- decontamination fluids; and
- landfill standing water;

and resource recovery of:

- battery casing materials;
- iron oxide;
- dust;
- sump sediments; and
- nickel-iron batteries (page 14-15)

However, the alternatives cease to be equivalent when soil stabilization is considered. As the table demonstrates, Alternative 6:

- increases volume (page 15);
- uses relatively new and complex technology (page 15-16);
- increases the amount of material handling;
- augments the risk of airborne dust emission (page 15);
- increases risks of worker exposure (page 15); and

- takes longer to complete,

thereby introducing possible delay and reduced effectiveness into the remedy (page 15). Alternative 5 suffers from none of these defects and costs about half as much (page 16). The issue, simply stated, is whether soil stabilization adds any increase in protection of human health and the environment proportional to the increase in cost. The answer is no.

As shown in Figure 1, soil treatment prior to consolidation in the landfill will not increase protection of human health or the environment. The soil will be consolidated above materials already present in the landfill, including slag, scrubber sludge, wastewater treatment sludge, and other lead-bearing materials. Additional fill will be added to bring the landfill to a sufficient height for appropriate grading, with a highly impermeable RCRA cap consisting of a vegetated soil cover and synthetic liner added as well. To the extent a concern arises from leaching of liquids either present in the soil at the time of consolidation or introduced into the landfill through a breach in the synthetic membrane and the soil cover, any leachate migrating through the fill and into the soil will next move into the underlying area filled with the lead-bearing materials. That layer, which exhibits high alkalinity due to unreacted lime remaining in the landfill as a constituent of the treatment sludges, will buffer and render more alkaline any leachate moving into it. Thus, any lead and other heavy metals introduced into the leachate from the soil would be precipitated, preventing movement in the underlying layers. The buffering capacity of the underlying layer cannot be eliminated by the amount of leachate likely to penetrate breaches in the cap system under any reasonable worst-case scenario.

Moreover, the buffering capacity of the underlying material could be further enhanced by the addition of an agricultural limestone layer in the cap system such that any infiltrating stormwater which penetrated the cap would be rendered alkaline before reaching the soil. This innovative, built-in treatment component would be much more cost effective and implementable than the treatment remedy proposed for Alternative 6.

The ineffectiveness of soil stabilization is confirmed when considering the mass of lead already residing in the landfill. The calculations provided in Table 2 demonstrate that the mass already present is very great, probably about 5,400 tons held in about 105,000 yd^3 of material. In comparison, the amount of lead expected to be added by consolidation of the surrounding soils into the landfill is relatively small, approximately 540 tons, even though the volume of soil above the 1,000 mg/kg level is about 40,000 yd^3. Thus, treating the soil prior to introduction into the landfill will not have any measurable impact on leachate from the landfill.

In the unlikely event the RCRA cap were breached, one can speculate that soil, as well as other landfill materials, might be ingested by on-site trespassers or workers. However, the soil will be covered with layers of clean fill, a synthetic liner and a vegetated soil cover. Any exposure of the underlying soil is likely to result from digging at least three feet through the cap. This amount of digging is not likely to occur. Furthermore, stabilization does not reduce the toxicity of the lead; it merely renders the lead less leachable. Thus, stabilization does not protect against the hypothesized, but unlikely, worst-case scenario.

CERCLA requires that any remedial action selected by U.S. EPA be cost-effective. 42 U.S.C. § 9605(a), 9621(a) (b). Although the term is not defined in CERCLA, by virtue of the recently promulgated National Contingency Plan, a remedy is cost-effective if its costs are proportional to the overall effectiveness of the remedy. 40 C.F.R. § 300.430(f) (1) (ii). In the present case, the cost differential between Alternative 5 and Alternative 6 is not proportional to the relative effectiveness of the proposed remedies. Alternative 6 is no more effective than Alternative 5 and is almost twice as expensive.

We also note that U.S. EPA has failed to provide the public with any explanation of how the cost-effectiveness determination in the Proposed Plan was reached. Under the cost section of the Proposed Plan (page 16), the agency notes that Alternative 5 is the least expensive of Alternatives 5 and 6. When selecting the preferred alternative (pages 16-17), the agency merely states that the "preferred alternative provides the best balance among the alternatives evaluated with respect to the first seven of the nine evaluation criteria." It is not evident from this conclusory statement how the agency addressed the concerns regarding cost-effectiveness stated above. Thus, the

Proposed Plan fails to provide adequate information on the basis for remedy selection as required by 40 C.F.R. § 300.430(f) (2).

Furthermore, statements in the Proposed Plan, as well as other documentation in the Administrative Record, indicate that treatment prior to consolidation is unnecessary. The agency notes that closure of the on-site landfill through the construction of a RCRA cap is a "highly reliable method for preventing direct contact with landfill contents and significantly reducing or eliminating any leachate or landfill contaminants into deeper soils or groundwaters beneath the landfill" (page 14). Furthermore, the Feasibility Study for the site was reviewed by the agency's oversight contractor, CDM Federal Programs Corporation, and its comments were forwarded to U.S. EPA and incorporated in the Administrative Record (See entry 160 at page 100 of the Administrative Record Index). On page 4 of the CDM document, the reviewer expresses concern about trucking materials from the site. He then suggests as an alternative that U.S. EPA consider the consolidation of resource recovery materials in the landfill. From this statement, it appears that the CDM reviewer considered consolidation of materials in the landfill as a safe alternative, comparable to consolidation of soils in the landfill. Given that the resource recovery materials are very high in lead and the soil under consideration for stabilization is relatively low in lead, consolidation without such treatment does not provide cause for concern.

In summary, there are no ARARs which require stabilization of the soil prior to consolidation. Alternative 5 is superior to Alternative 6 under the criteria of reduction of volume, short-term effectiveness, implementability, and cost. Alternative 5 is in no way inferior; it should be adopted.

2. Groundwater.

The Proposed Plan suggests that deep groundwater aquifer shows elevated levels of heavy metals (page 3). Furthermore, the Plan implies that there is a state requirement to remediate groundwater to background (page 13).

First, a review of the Feasibility Study ("FS") and subsequent sampling and analysis data submitted to U.S. EPA does not support the proposition that the deep groundwater aquifer has been contaminated. However, some of the confusion on this issue may have resulted from the labels used to identify monitoring

wells in the RI/FS Reports. Figure 2 will help illustrate the point. The monitoring wells drilled as part of the RI were all screened in the shallow alluvial aquifer. Those in the lower portion of the shallow aquifer were labeled with a "D" suffix and those in the upper zone with a "S" suffix. Thus, the suffix "D" did not refer to the deep bedrock aquifer.

Certain contaminants were identified in well 12D, which is in the shallow aquifer at the soil/bedrock interface. To demonstrate that the contaminants could not migrate downward, another well (12B) was drilled and screened fifty feet deeper than well 12D. It showed no evidence of contamination even though it was directly below well 12D. As a result, the Record of Decision should clarify this point by noting that no contamination was identified in the deep bedrock aquifer.

Regarding the second proposition, we strongly disagree that there is a state ARAR requiring cleanup of groundwater to background. Pennsylvania has finalized a state groundwater protection strategy (February 1992), but it is neither a regulation nor a statute and is thus not an ARAR. A state standard must be properly promulgated to be considered an ARAR. 42 U.S.C. § 9621(d). While state RCRA requirements, which in the case of Pennsylvania are virtually identical to federal RCRA regulations, may be ARARs, they address groundwater monitoring and sampling requirements, but do not require cleanup to background. 25 Pa Code § 264.90-.100.

In any case, the aquifer of concern is the deep bedrock aquifer, not the shallow alluvial aquifer, which is classified as Class IIIa (that is, it lies adjacent to a higher class aquifer, the Class II deep bedrock aquifer). The FS demonstrates that such migration cannot occur under the artesian conditions present at and around the site. In addition, natural attenuation would further prevent migration if it were otherwise possible. Inorganic contaminants simply do not migrate through the soil matrix in the same manner as organic contaminants.

The Proposed Plan (page 9) suggests that one of two activities should be considered to attenuate contaminant migration, (a) pH adjusted injection or (b) interception by a limestone filled trench. While we do not believe either is necessary, the pH injection suggestion is particularly inappropriate. Time and money would be wasted on a remedial activity the effect of which would be reversed over time as acid mine drainage reduced the pH of the soil in the area. Permanent

treatment through the use of limestone would not be subject to such reversal.

3. Stormwater Treatment.

The Record of Decision should be written in a manner which clarifies the Proposed Plan's allusions to stormwater treatment. The Proposed Plan in its discussion of Alternatives 5, 6, and 7 indicates that activities required under Alternative 3 would also be included. Alternative 3 speaks of use of the existing treatment plant to reduce levels of site contaminants. It does not state when it is appropriate to terminate the activity. We believe that the Record of Decision should clarify that once the source control remedial activities are undertaken at the site, no further stormwater treatment will be required.

4. Choice of Soil Cleanup Standards.

On page 5 of the Proposed Plan, U.S. EPA adopts a 1,000 mg/kg (maximum) cleanup level for lead in on-site soils. U.S. EPA states that the "Integrated Uptake/Biokinetic Model (IU/BK) and existing policy indicate that lead levels present in soils and waste materials on-site should be reduced to provide protection of human health and the environment." Generally, we agree that a reduction in very high lead levels present at the site is advisable; the disagreement lies in the necessity of reducing the level to 1,000 mg/kg. U.S. EPA's justification for choosing the 1,000 mg/kg standard is based on "present U.S. EPA policy...for residential areas, as supported by the Integrated Uptake/Biokinetic Model." U.S. EPA chooses 1,000 mg/kg as a "reasonable level to protect the health of adult on-site workers." We object strenuously to U.S. EPA's method in arriving at this cleanup level for the following reasons:

- The Proposed Plan and administrative record do not contain adequate substantiation of the choice.
- Under applicable principles of administrative law, reliance on a guidance policy cannot sustain the decision.
- U.S. EPA's use of the IU/BK model does not appear in the plan or in the administrative record.

a. <u>The Administrative Record and Proposed Plan do not substantiate the 1,000 mg/kg cleanup level</u>.

The Proposed Plan's rationale for adopting a 1,000 mg/kg cleanup level is not sustainable. Adopting a workers' cleanup level in the range of that applicable to childhood residential exposure scenarios can be justified only if the data and assumptions underlying the childhood scenario are applicable to the worker scenario. In the first instance, the Proposed Plan does not in any way set forth or discuss such data and assumptions. As a result, it is impossible to comment in depth on the methodology. If the Record of Decision provides such data and assumptions, we reserve the right to comment. In the interim, however, the mismatch between the two scenarios is evident.

Assuming for sake of argument that the 500-1,000 mg/kg level for childhood exposure in the residential setting is appropriate (an assumption directly challenged by many of us at other sites), the U.S. EPA guidance exposure levels are arrived at by examining conservative assumptions about ingestion of soils by children and comparing projected blood levels with weakly correlated blood-lead/health-effect conclusions reached by a single researcher. The same approach is not applicable to adults. First, adults are not as likely to ingest soils in the industrial setting as children are in the residential setting. Second, even if ingestion rates were similar, the larger size of the adult results in lower blood lead levels. Third, there is no data to indicate that low levels of lead in the adult bloodstream have any deleterious effect.

The Tonolli Site Feasibility Study Report and the Human Health and Ecological Assessment discuss the appropriate cleanup level. The reports rely in part on the Society for Environmental Geochemistry and Health ("SEGH") model for setting a cleanup standard of 3,200 mg/kg because it specifically accounts for data and assumptions about adult worker exposure, unlike the standard derived from the IU/BK model.

U.S. EPA has stated that it does not "recognize" the SEGH model for use in such circumstances. When no promulgated rule on point exists, U.S. EPA cannot claim that a model may be considered only if the agency has "recognized" it, particularly where no alternative is discussed and substantiated in the Proposed Plan or administrative record. As explained below,

under applicable principles of administrative law the agency must consider all relevant materials at its disposal or presented to it and reach a reasoned, balanced conclusion based on such available evidence. If the agency desires to set a firm rule by which to make such decisions, it must do so based on standard rule-making procedures.

Furthermore, while the agency claims reliance on the IU/BK model, nowhere in the record is the model used to demonstrate the advantage of one cleanup level over another. Rather, the model only indicates that the current lead levels at the site should be reduced. The issue remains as to what level.

b. Reliance on a guidance policy without either consideration of other available evidence or reconsideration of the basis for the guidance constitutes illegal rule-making.

Congress did not intend when enacting CERCLA or the SARA amendments to displace basic principles of administrative procedure. Use of a guidance policy passes into the realm of illegal rule-making when it serves as a substitute for a de novo, ad-hoc administrative proceeding to which a regulated party has a right. McLouth Steel Products Corp. v. Thomas, 838 F.2d 1317 (D.C. Cir. 1988). A party subjected to an ad-hoc proceeding must have the ability to raise arguments about every issue of importance which has not previously been the subject of proper rule-making procedures. Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837 (1984). Thus, U.S. EPA cannot base a decision about cleanup levels solely on "policy."

The Proposed Plan and other documents in the administrative record do not discuss why an U.S. EPA policy is appropriate for application at the Tonolli site or provide a basis for comments. The original 1989 guidance document on soil lead does not on its face provide justification for the 500-1,000 mg/kg level. While it does cite a January 1985 Center for Disease Control publication, "Preventing Lead Poisoning in Young Children," that document, like the guidance, contains only a naked statement that "lead in soil and dust appears to be responsible for blood lead levels in children increasing above background levels when the concentration in the soil or dust exceeds 500-1,000 ppm." P. 7. In addition to failing to correlate any increase above background with health effects, it neither notes nor discusses which, if any, of the references

listed at the back of the pamphlet serves as a basis for the selection of 500-1,000 ppm. An ATSDR document examined by us does cite studies by Baker (1977) and Mielke (1984) as supportive of the same level, but Baker studied house dust, not soil, and Mielke's study suggests that hazards from lead in house paint are a primary cause of blood lead elevations found in the study, not soil lead. Thus, U.S. EPA has never fairly established a basis for the level set forth in the guidance document in the first instance. Continued dependence on the policy without adequate justification is inappropriate, particularly in light of evidence refuting it, and is illegal.

c. U.S. EPA failed to demonstrate how the IU/BK supports the proposed cleanup level.

While the Proposed Plan references the IU/BK model, as noted previously, nothing in the plan or administrative record demonstrates how the model supports the choice of one cleanup objective over another. As a result, we have not been provided with a basis for commenting on the reference.

Past experiences with U.S. EPA in general and Region III in particular indicate an agency pattern of inserting into the IU/BK model default data designed to reach the desired result rather than actual data likely to predict the actual effect of soil lead concentrations. Despite U.S. EPA's inability to predict blood lead levels at sites across the nation using its default data, it continues to insist on the approach in the face of mounting evidence that it is seriously flawed. Accordingly, the opportunity to comment on U.S. EPA's use of the model becomes a key concern to us, whose experiences with the model indicate that the 3,200 mg/kg level determined through use of the SEGH model is more than adequate to protect human health.

We also understand that the IU/BK model and its usefulness for setting cleanup levels is currently the subject of review within U.S. EPA. Our only input in the process, in the absence of a rule-making proceeding, is through ad-hoc proceedings like the Tonolli Site Record of Decision. Thus, our ability to have input into the debate is critical. With millions of their dollars at stake, the parties to this correspondence have a basic constitutional right to a voice.

5. Off-site Cleanup.

The Proposed Plan also requires that a small portion of off-site residential land be cleaned up to 500 ppm. We do not believe that the administrative record demonstrates that the contamination around the residence was caused by the Tonolli Site. In fact, a conversation with the present landowner indicates that the area of concern consists of fill which was brought to the yard from areas away from the Tonolli Site. Accordingly, the Record of Decision should not require cleanup of materials which are not site related.

For reasons similar to those recited in Section 4, we note that U.S. EPA's choice of a soil cleanup level (500 mg/kg) has no substantiation in the Administrative Record. We are aware that the agency would again claim reliance on its soil-lead cleanup guidance, a procedure subject to the same flaws previously identified.

We appreciate your consideration of these comments. As arranged with Ms. McCartney, we look forward to meeting with you and other Agency representatives concerning these matters at the Philadelphia offices of U.S. EPA on September 9, 1992 at 10:30 a.m. (EST).

Sincerely,

JOHNSON CONTROLS, INC.

James M. Thunder Jr.

James M. Thunder
Corporate Environmental Manager

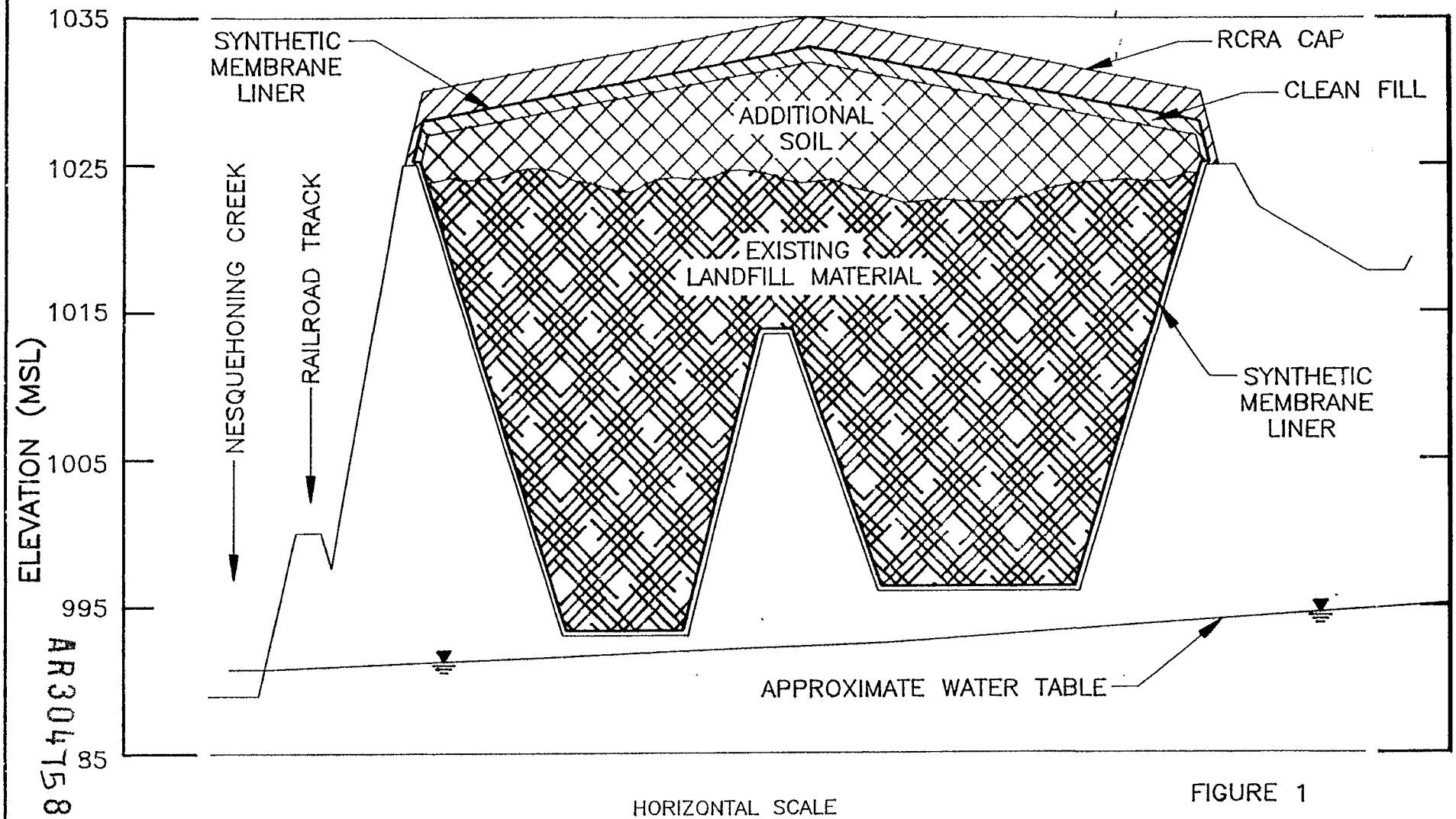
JMT:td

thunder\tonolli.827

TABLE 1
SUMMARY OF REMEDIAL ALTERNATIVES 5 AND 6 VERSUS NCP CRITERIA
TONOLLI CORPORATION SUPERFUND SITE
NESQUEHONING, PENNSYLVANIA

	ALTERNATIVE 5	ALTERNATIVE 6 (EPA Proposed Alternative)
THRESHOLD CRITERIA		
Overall Protection of Human Health and the Environment	♦ Same Degree of Protection	♦ Same Degree of Protection
Compliance with ARARs	♦ Compliance with Federal and State ARAR's	♦ Compliance with Federal and State ARAR's
PRIMARY BALANCING CRITERIA		
Long Term Effectiveness and Permanence	♦ Same Effectiveness and Permanence	♦ Same Effectiveness and Permanence
Reduction of Toxicity, Mobility & Volume Through Treatment	♦ Reduces Toxicity, Mobility & Volume Through Onsite Treatment of: Stormwater Groundwater Leachate Decontamination Fluids	♦ Reduces Toxicity, Mobility & Volume Through Onsite Treatment of: Stormwater Groundwater Leachate Decontamination Fluids
	♦ Reduces Toxicity, Mobility & Volume Through Resource Recovery of: Battery Casings Dust Sump Sediments	♦ Reduces Toxicity, Mobility & Volume Through Resource Recovery of: Battery Casings Dust Sump Sediments
		♦ **Onsite Treatment of Soil**
	♦ Overall Decrease in Volume of Contaminated Material	♦ **Increases volume of contaminated soil**
Short-Term Effectiveness	♦ Shortest Duration	♦ **Complex Technology**
	♦ Least Complex	♦ **Complex Equipment**
		♦ **Longer Duration**
		♦ **Increases Short-Term Risk**
Implementability	♦ Most Implementable	♦ **New Technology**
		♦ **Possible Delays and Reduced Effectiveness**
Cost	♦ Least Expensive of those Alternatives which Incorporate Treatment - $12 million	♦ **Significantly Higher Cost - $24 million**

	DRAWN BY	C.A.J. 8-20-92	CHECKED BY APPROVED BY	WCG WCG	8-26-92 8-26-92	DRAWING NUMBER	89--599--A52



AR304758

CAP MATERIALS

- SOIL LINER
- FLOW ZONE AND SYNTHETIC MEMBRANE LINER
- CLEAN FILL

HORIZONTAL SCALE

100 0 100

VERTICAL SCALE

10 0 10

FIGURE 1

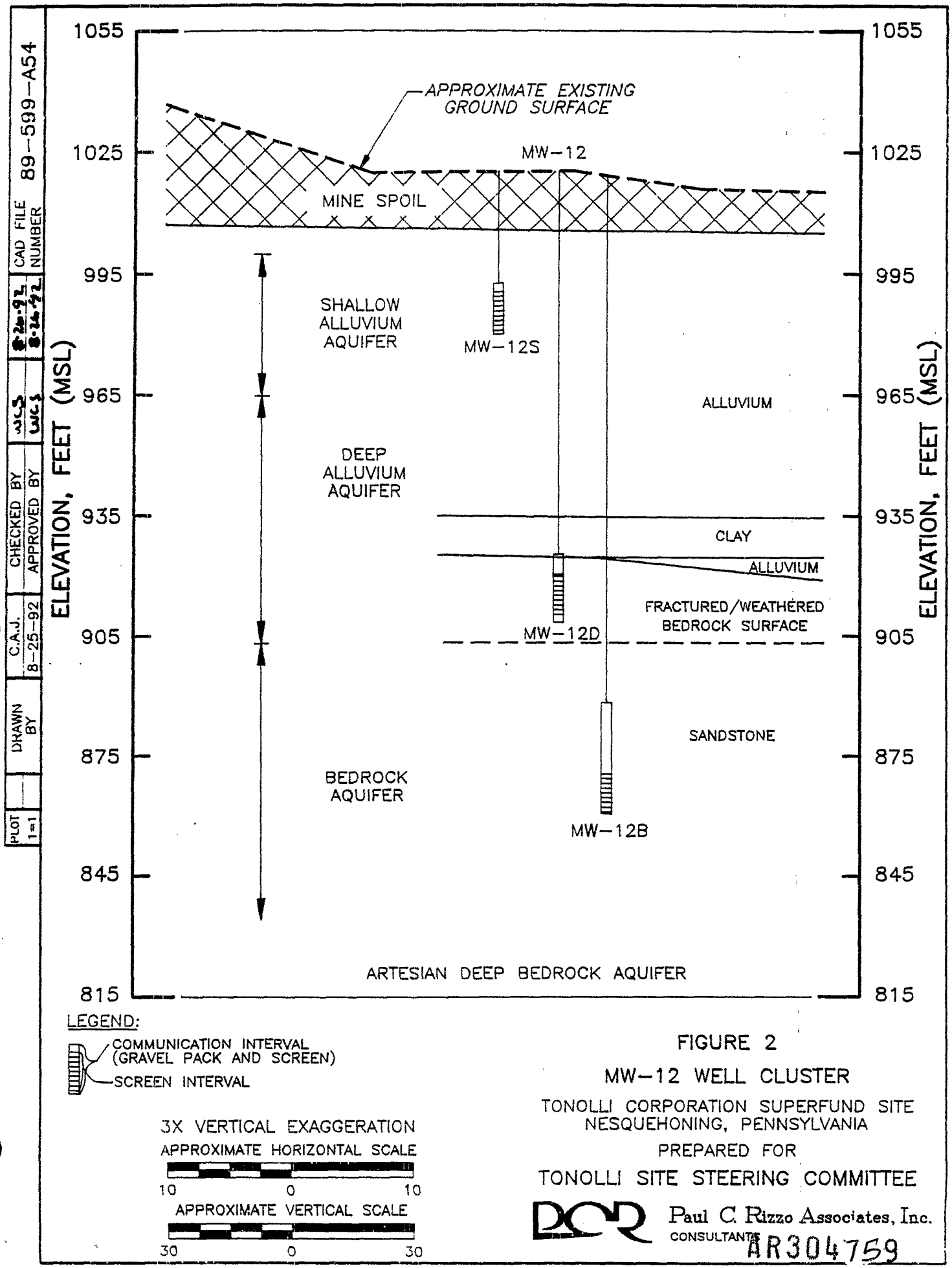
LANDFILL CROSS SECTION

TONOLLI CORPORATION SUPERFUND SITE
NESQUEHONING, PENNSYLVANIA

PREPARED FOR

TONOLLI SITE STEERING COMMITTEE

Paul C. Rizzo Associates, Inc.
CONSULTANTS



LEGEND:

COMMUNICATION INTERVAL (GRAVEL PACK AND SCREEN)

SCREEN INTERVAL

3X VERTICAL EXAGGERATION

APPROXIMATE HORIZONTAL SCALE

10 0 10

APPROXIMATE VERTICAL SCALE

30 0 30

FIGURE 2

MW-12 WELL CLUSTER

TONOLLI CORPORATION SUPERFUND SITE
NESQUEHONING, PENNSYLVANIA

PREPARED FOR

TONOLLI SITE STEERING COMMITTEE

Paul C. Rizzo Associates, Inc.
CONSULTANTS

TABLE 2

QUANTITY OF LEAD - LANDFILL V. ADDITIONAL SOIL
TONOLLI CORPORATION SUPERFUND SITE
NESQUEHONING, PENNSYLVANIA

MASS OF LEAD IN LANDFILL

MATRIX	ESTIMATED UNIT WEIGHT	ESTIMATED QUANTITY (cy)	ESTIMATED LEAD CONCENTRATION (mg/kg)	TOTAL LEAD (tons)
Slag	3 tons per cy	41,650	30,000	3,750
Battery Casings and Sludge	50 lbs. per cy	63,350	38,480	1,645
			TOTAL	5,395 tons

MASS OF LEAD IN ADDITIONAL SOIL

MATERIAL DESCRIPTION	ESTIMATED QUANTITY (cy)	ESTIMATED LEAD CONCENTRATION (mg/kg)	TOTAL LEAD (tons)
Soil Containing Lead:			
> 10,000 mg/kg	7,250	39,250	404
3,200 to 10,000 mg/kg	14,500	3,950	93
1,000 to 3,200 mg/kg	17,400	1,550	44
		TOTAL	541 tons